OLYMPUS

MAINTENANCE MANUAL

CLH-SC

INTRODUCTION

Repairs of this product require high-grade special knowledge and technique. We recommend to contact the Olympus agent in your country when product Goes out of order.

For remodeling or repairs to be done by the agent or person not authorized by us, we will not warrant the product and not be liable for any result.

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1. SPECIFICATION OF PRODUCTS

1. Features

- The CLH-SC is a simple high intensity light source designed for use with a medical rigid scope or an endoscope with an eyepiece of the same shape as of a medical rigidscope.

2. Specifications

Item			Specifications
Applicable scope and light guide	Type of scope and light guide	Light guide for rigid scope	A3061, A3062, A3071, A3072, A3081, A3082, A3091, A3092, A3093, A3094, A3095, A3096
		Rigid scope	Rigid scope connectable with the light guides A3061, A3062, A3071, A3072, A3081, A3082, A3091, A3092, A3093, A3094, A3095, and A3096. The others are not applicable.
		Endoscope (with the same eyepiece as that of a rigid scope)	CYF, CYF-2, URF, URF-2, URF-P2, HYF-P, HYF-1T, ENF-P, ENF-L3, ENF-P4, ENF-XP, PF-14, PF-22, PF-28, LTF, LF-1, LP-2, LP-P, LF-T, CHF-CB30
Illumination function	Illumination light	Illumination lamp	① Symbol in Olympus: MD-151 ② Type: Halogen lamp 15 V/150 W ③ Manufacture: USHIO ④ Model: JCM15-150FP ⑤ Service life: Average 50 hours ⑥ Color temperature: 3250° K (published by the manufacturer's catalog)
	Brightness adjustment	Method	Manual adjustment by the brightness control on the front panel (light path shielding diaphragm)
Cooling	Method		Forced air cooling by a fan

Item			Specifications
Safety	Laws and regulations applied	For destinations	Applied laws and regulations, classifications, etc.
		EU/EFTA	MDD Class: I CE marking
		USA	FDC law UL mark/CUL mark
Others	Cleaning	Panel and outer casing	Clean with the gauze moistened with 70% ethyl alcohol, 70% isopropyl alcohol or neutral cleanser. Dry sufficiently after cleaning with alcohol.
	Using conditions	Classification of medical instruments	100 V: BF type instruments
			120 V, 200 V: BF type mounting units
			Protection against an electrical shock: Class I instruments
		Supply voltage	100 V, 120 V, 220 V, 230 V, 240 V (depending on destinations)
		Supply voltage fluctuation	± 10% or less
		Power consumption	100 V, 1.7 A
			120V, 1.7 A
			220/230/240 V, 1.0 A
	Replaceable parts	User service	Illumination lamp JCM15-150FP (MD-151)
		Fuse	Delay channel 250 V, 2 A T2A 250 V
	Others	Dimensions	220 (W) x 290 (D) x 74 (H) mm (excluding the projections)
		Weight	5kg
		Panel	1 type
		Power cord	100/120 V: Cord set with a 3-core hospital grade plug 220/230/240 V: 3-core (plug-less) set

3. Using Conditions

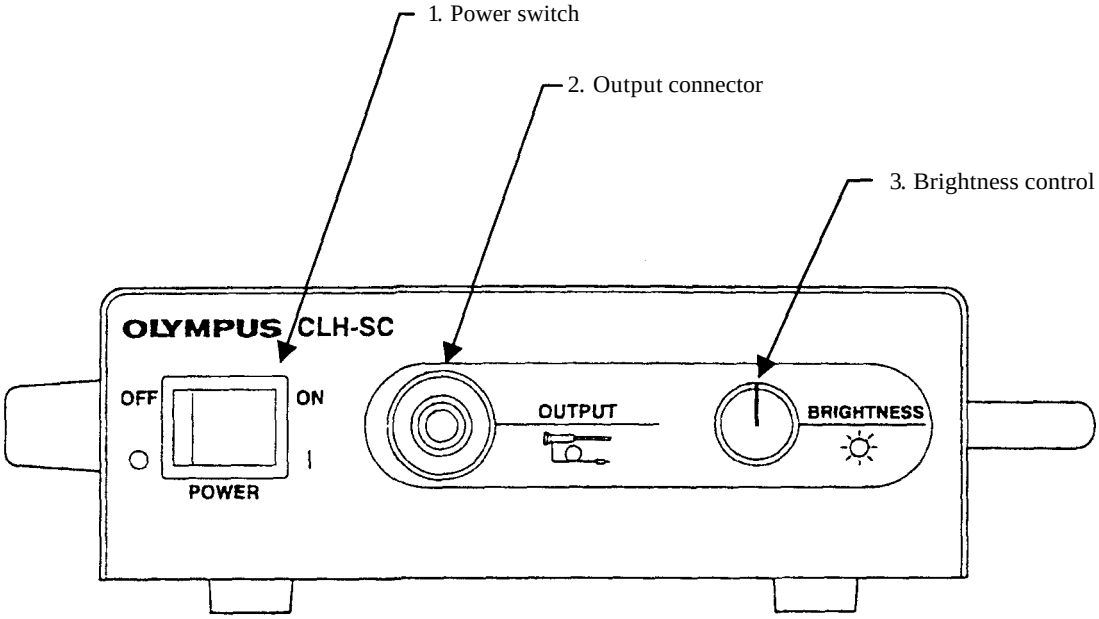
① Use in medical facilities under the direction of doctor.
② Don't use directly to the heart. (BF instrument)
③ Ground the outer casing for safety.
④ Don't use in an inflammable atmosphere.
⑤ Don't use with the following electronic devices.
   a. Among the devices designed to apply medical treatment with electronics to a patient, those which are not confirmed in safety when combined with the CLH-SC.
   b. Among the devices not designed to apply medical treatment with electronics to a patient, those which are not confirmed in safety such as a leakage current, etc.
⑥ Power supply

Rated voltage	100 V	120V	220, 230, 240 V
Input power supply	1.7 A	1.7 A	1.7 A
Frequency	50/60 Hz		
Voltage fluctuation	± 10% or less		

⑦ Environmental conditions
Ambient temperature: 10 - 40°C
Relative humidity: 30 - 80%
Atmospheric pressure: 700 - 1060 hPa

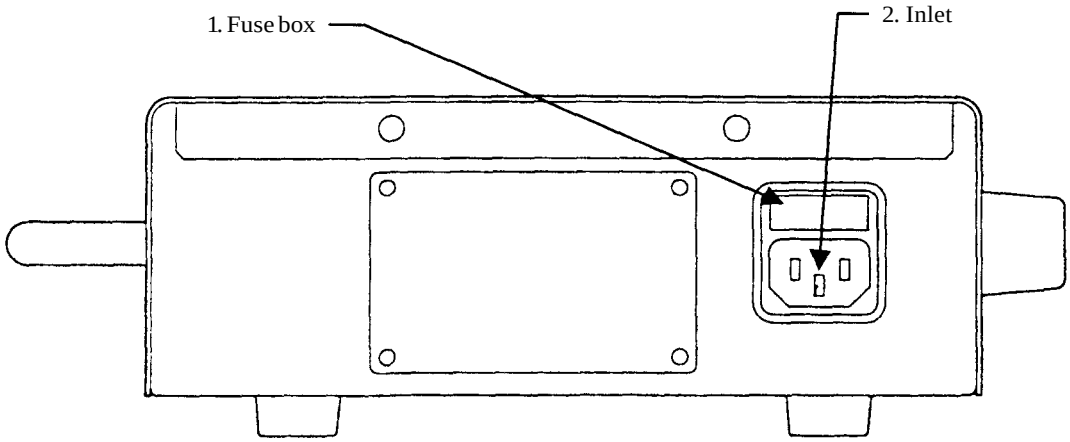
4. Nomenclature

4-1. Front panel



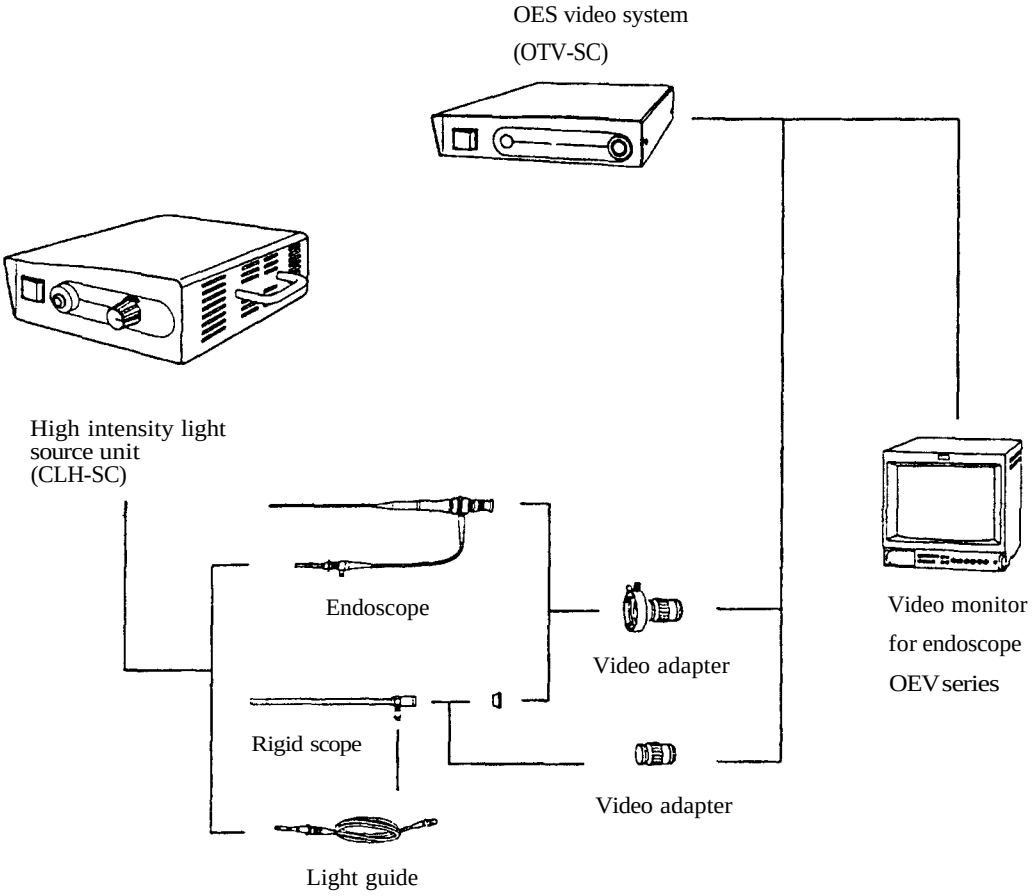
1. Power switch
   Push the right side to turn on the unit. The switch lamp lights and the illumination lamp (halogen) lights up.
2. Output connector
   Supplies an illumination light to the scope and light guide cable connected.
3. Brightness control
   Turn clockwise to increase brightness and counterclockwise to darken.

4-2. Rear panel



1. Fuse box
   Contains the fuse to prevent a fire due to the light source or other danger when en error occurs.
2. Inlet
   Connects the power cord.

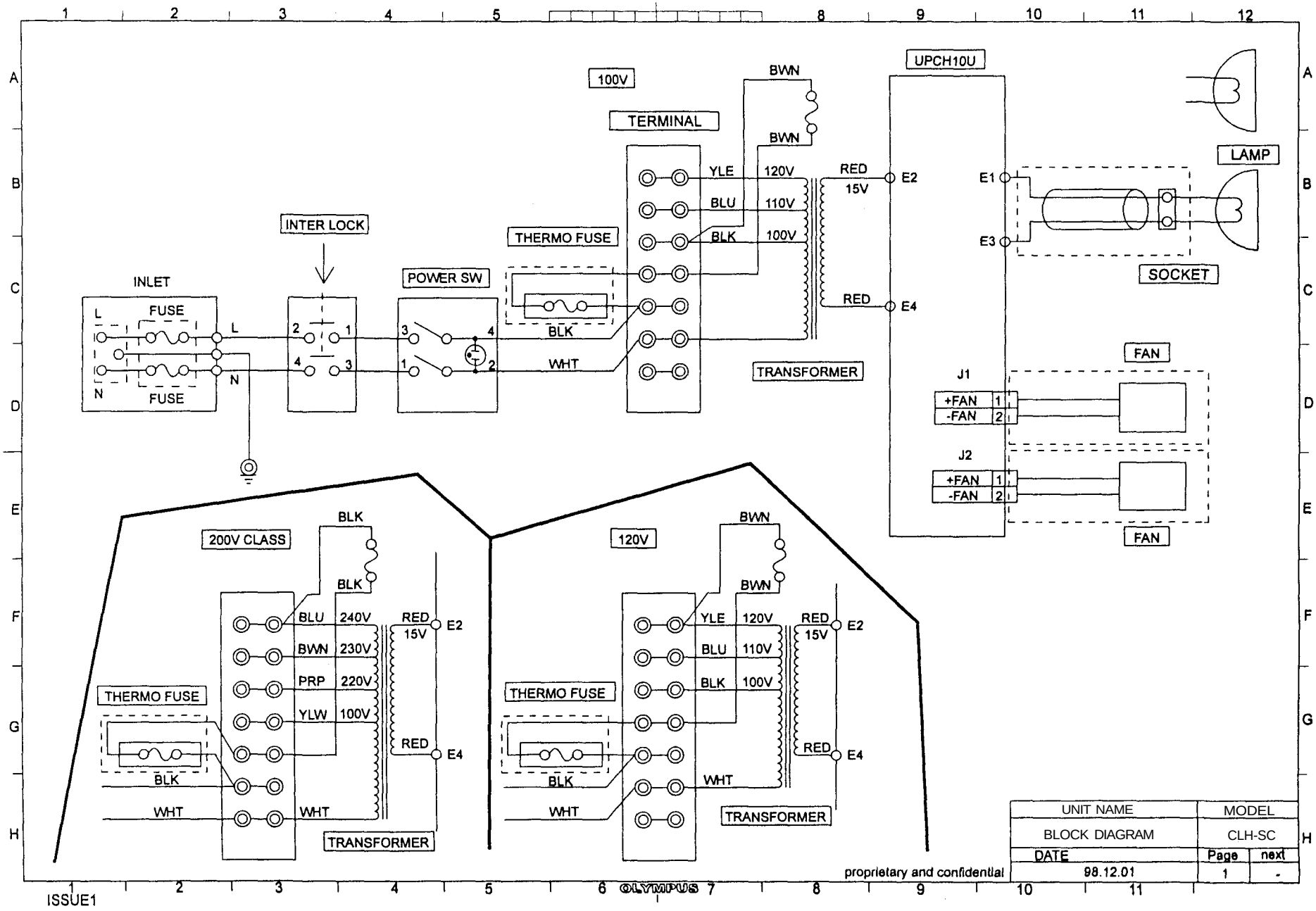
System Diagram



2. DESCRIPTION OF BLOCK

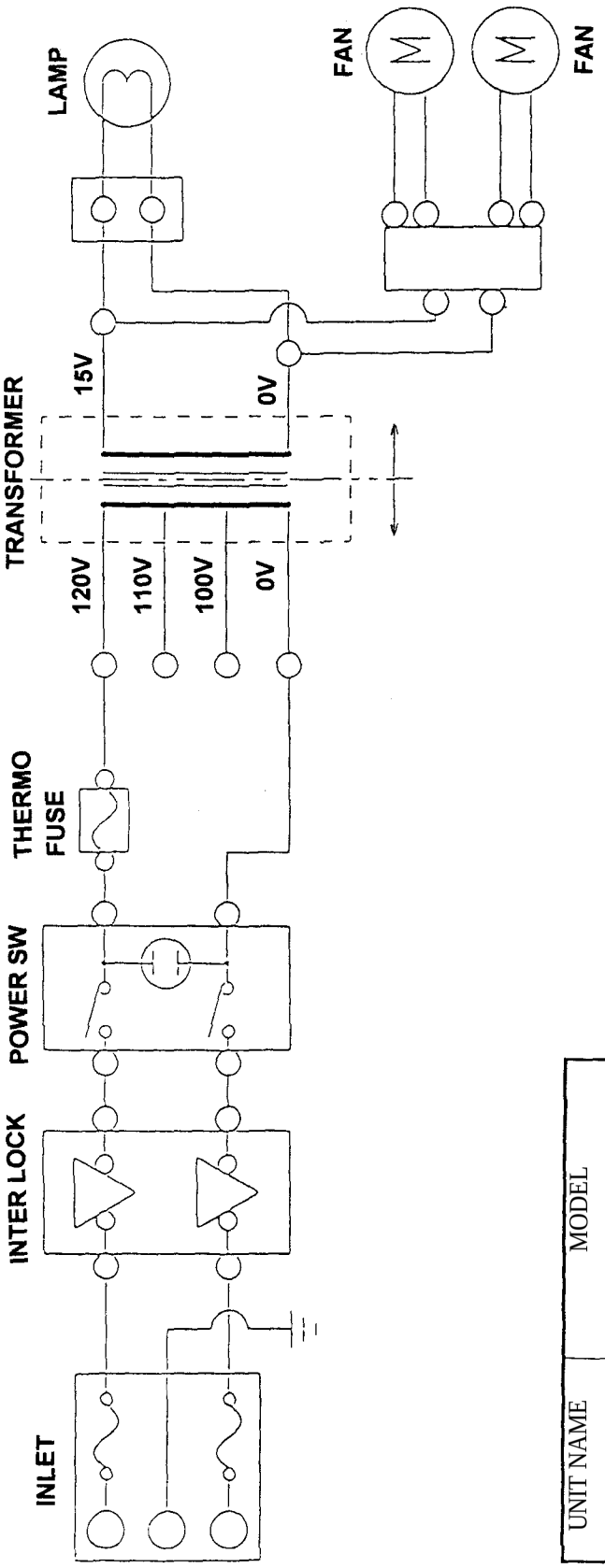
1. Operation of Block

Operation of the CLH-SC is described using a block diagram (2-2).
Power supplied on the power cable is applied to the interlock switch through two fuses. The power passing through the interlock switch is applied to the power switch on the front panel and is then sent to the terminal block. The power is returned from the live side to the terminal block through the thermo-fuse provided on the side of the power switch. The thermo-fuse operates to stop all functions and avoid a danger when the fan stops, the air duct is blocked and the main body is abnormally heated. The nominal operating temperature of the thermo-fuse is 117°C.
The power of 15 VAC for lighting the lamp is decreased by the transformer and is applied to the secondary side to supply power to the lamp. The DC fan is supplied with the power that is obtained by rectifying the lamp power supply by a diode and then smoothing by a capacitor. The transformer is provided with a thermo-fuse of 135°C to prevent overheat, but the fuse can not be replaced. If the fuse blows, the transformer must be replaced. This power supply circuit is provided on the UPCH10 board. A branch from the transformer to the lamp socket, a fan rectifying/smoothing circuit and two connectors to supply power to the fan are provided.


100V
TERMINAL
BWN
BWN
YLE
120V
BLU
110V
BLK
100V
RED
15V
E2
RED
E4
UPCH10U
LAMP
E1
E3
SOCKET
INTER LOCK
THERMO FUSE
POWER SW
INLET
L
FUSE
N
FUSE
BLK
WHT
TRANSFORMER
FAN
J1
+FAN
-FAN
J2
+FAN
-FAN
FAN
200V CLASS
BLK
BLK
BLU
240V
BWN
230V
PRP
220V
YLW
100V
RED
15V
E2
RED
E4
THERMO FUSE
BLK
WHT
WHT
TRANSFORMER
120V
BWN
BWN
YLE
120V
BLU
110V
BLK
100V
RED
15V
E2
RED
E4
THERMO FUSE
BLK
WHT
WHT
TRANSFORMER
proprietary and confidential
UNIT NAME
BLOCK DIAGRAM
MODEL
CLH-SC
DATE
98.12.01
Page
1
next
-
ISSUE1
OLYMPUS

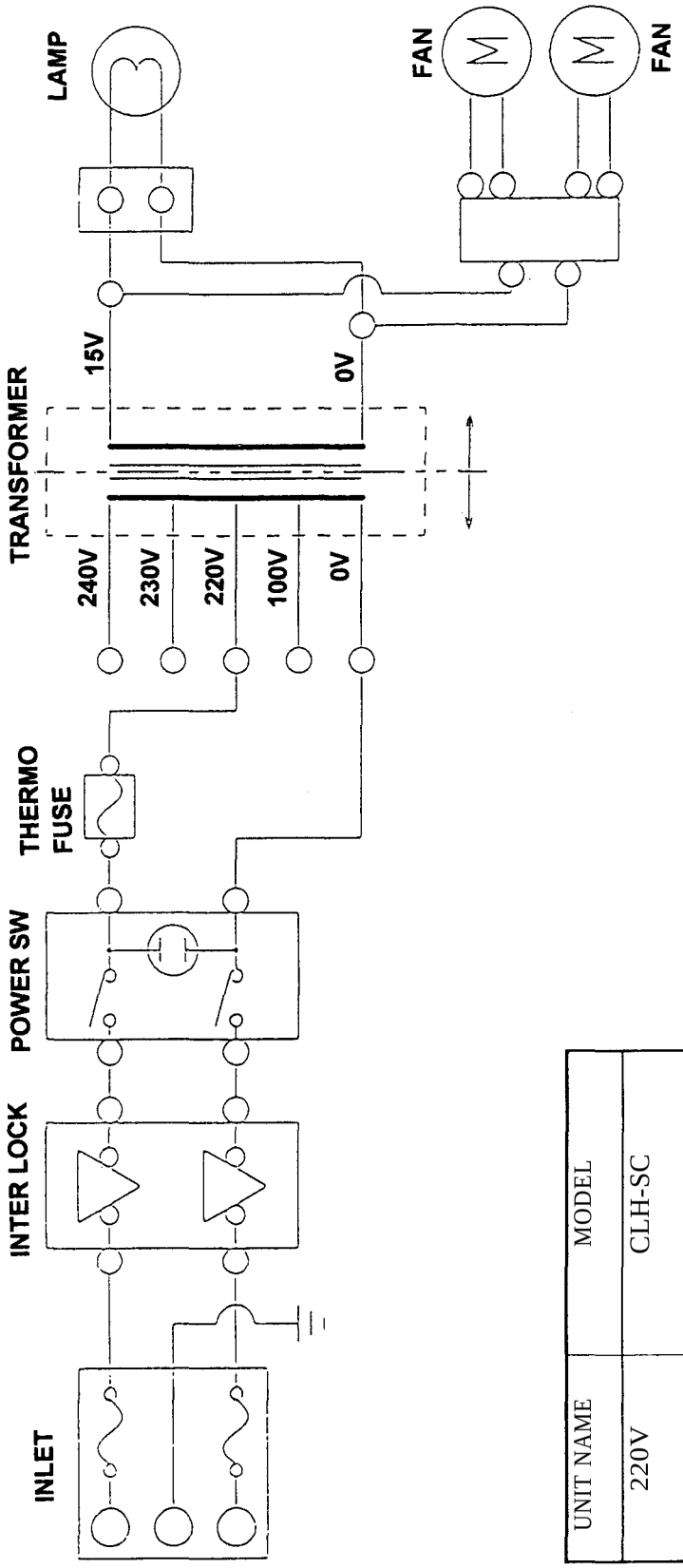
3. CIRCUIT DIAGRAM

120V



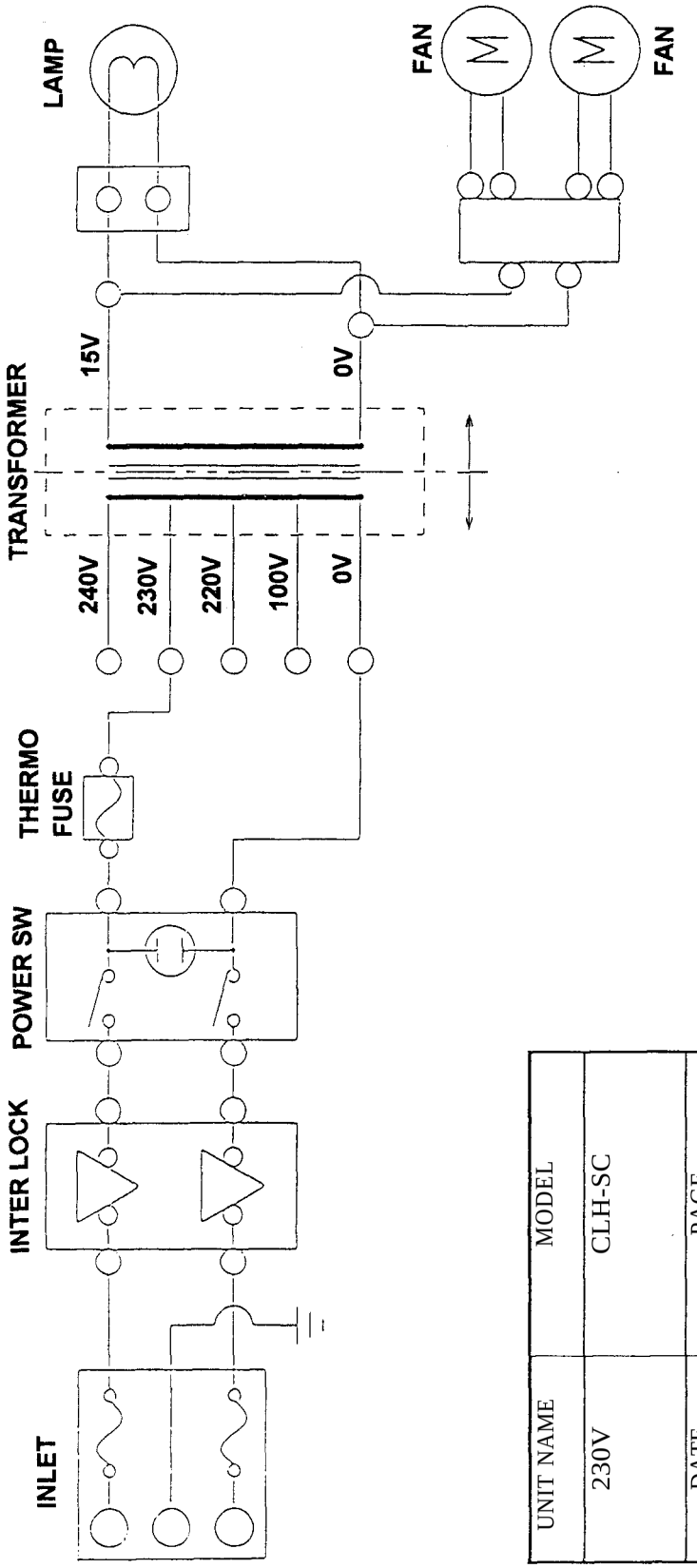
MODEL	CLH-SC	PAGE	1/4
UNIT NAME	120V	DATE	99-01

220V



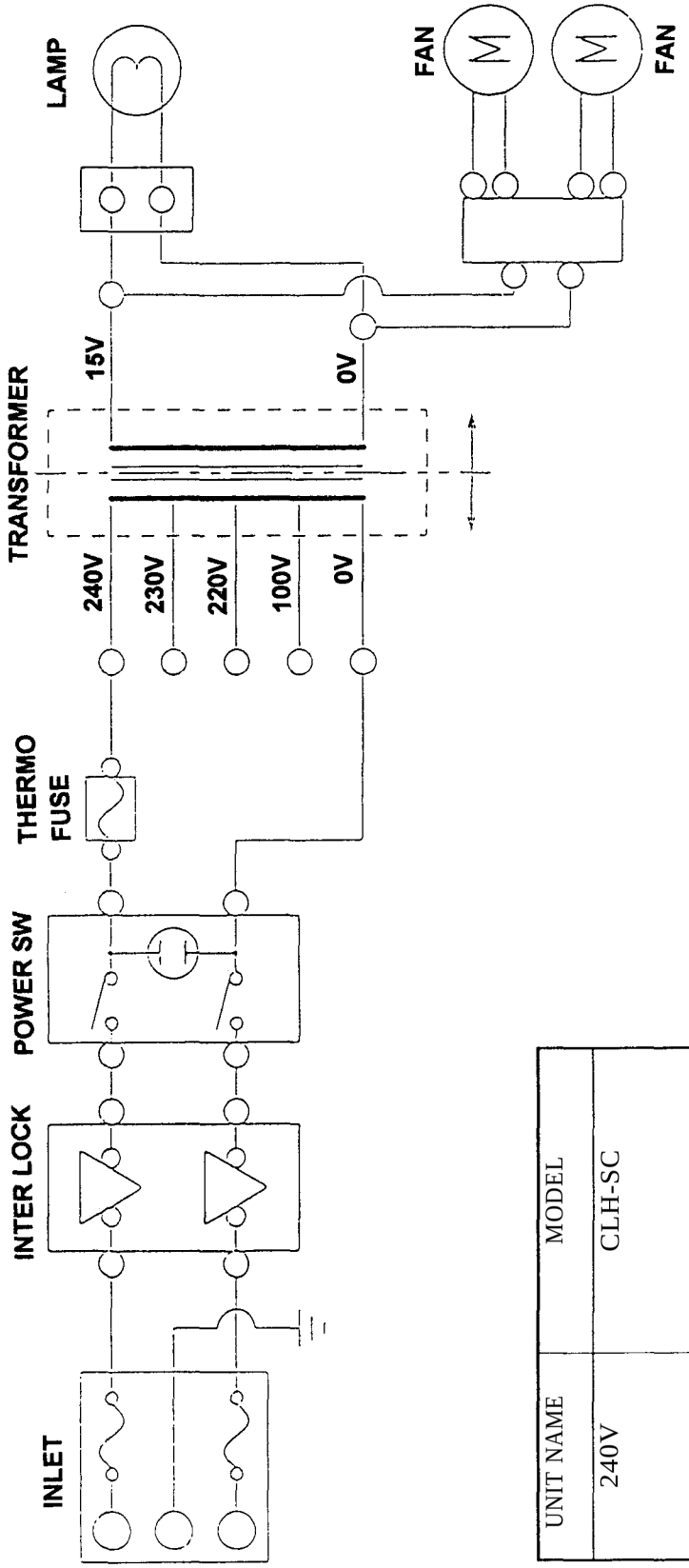
UNIT NAME	MODEL
220V	CLH-SC
DATE	PAGE
99-01	2/4

230V



UNIT NAME	MODEL		
230V	CLH-SC		
DATE		PAGE	
99-01		3/4	

240V



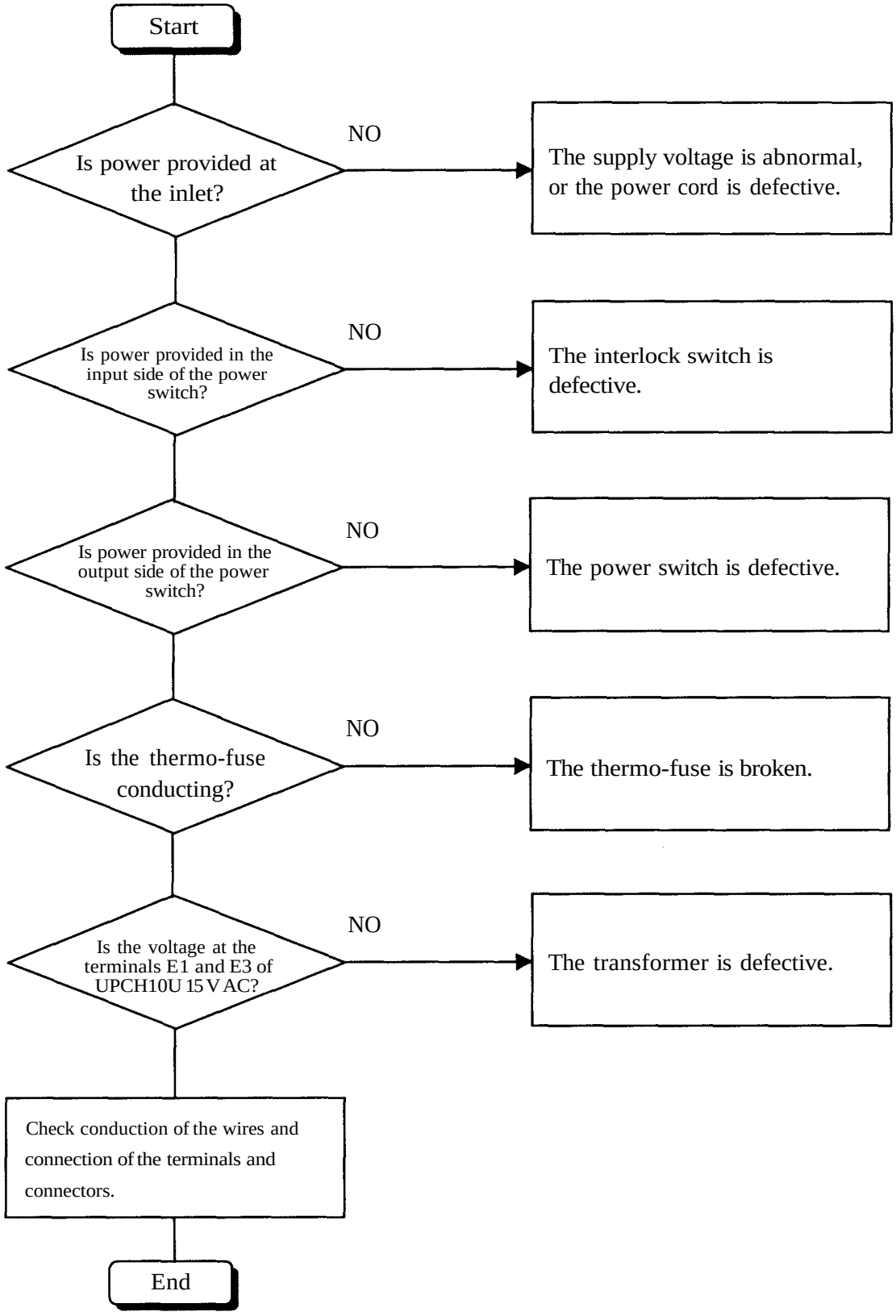
UNIT NAME	MODEL
240V	CLH-SC
DATE	PAGE
99-01	4/4

4. TROUBLESHOOTING

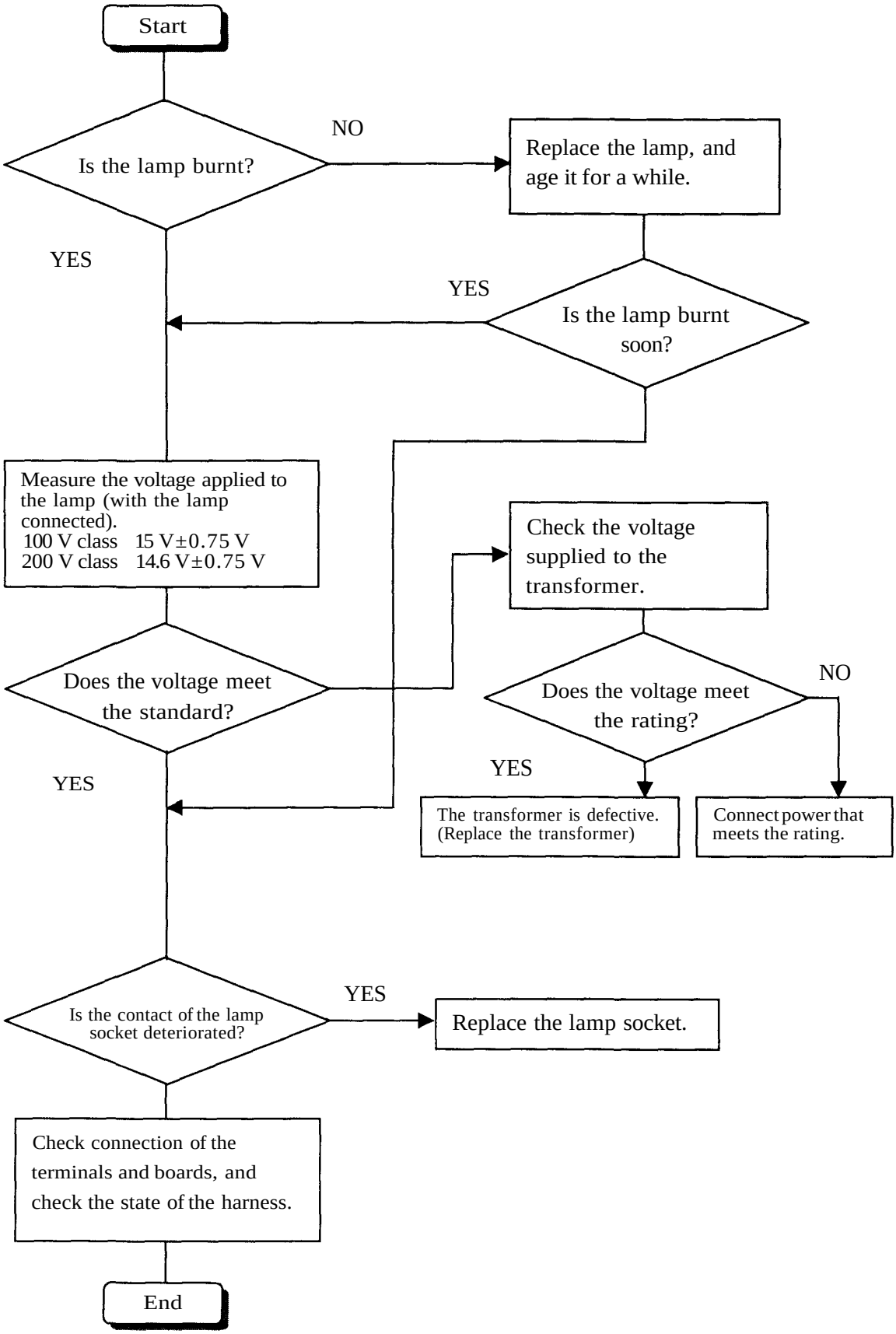
Symptoms

1. Power is not supplied. 4-2
2. The lamp does not light at all, burns out soon or turns off after once turning on. 4-3
3. The fan does not work. 4-4
4. Brightness is insufficient. 4-5
5. Light can not be controlled. 4-6

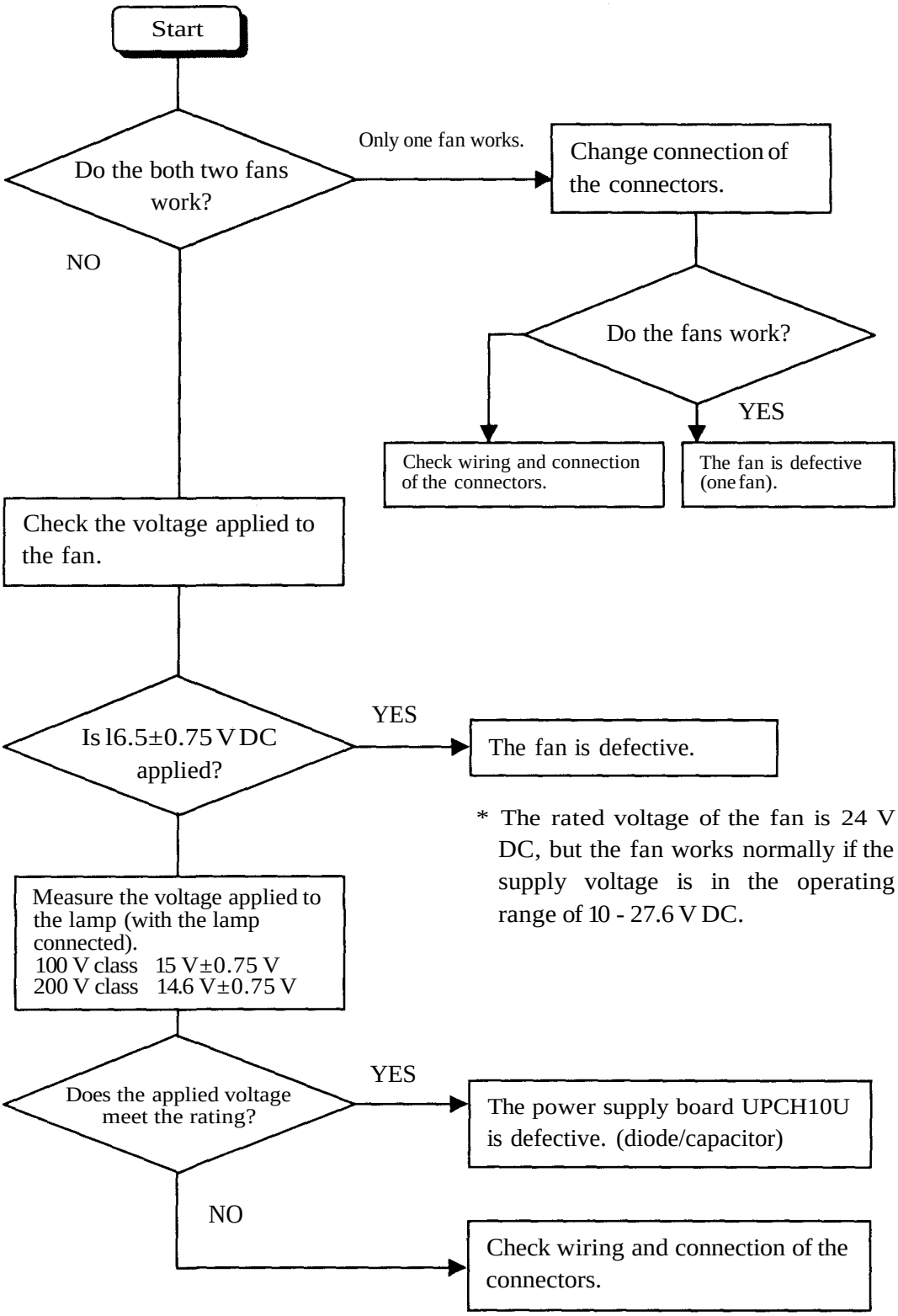
[Symptom: Power is not supplied.]


Start
Is power provided at the inlet?
NO
The supply voltage is abnormal, or the power cord is defective.
Is power provided in the input side of the power switch?
NO
The interlock switch is defective.
Is power provided in the output side of the power switch?
NO
The power switch is defective.
Is the thermo-fuse conducting?
NO
The thermo-fuse is broken.
Is the voltage at the terminals E1 and E3 of UPCH10U 15 V AC?
NO
The transformer is defective.
Check conduction of the wires and connection of the terminals and connectors.
End

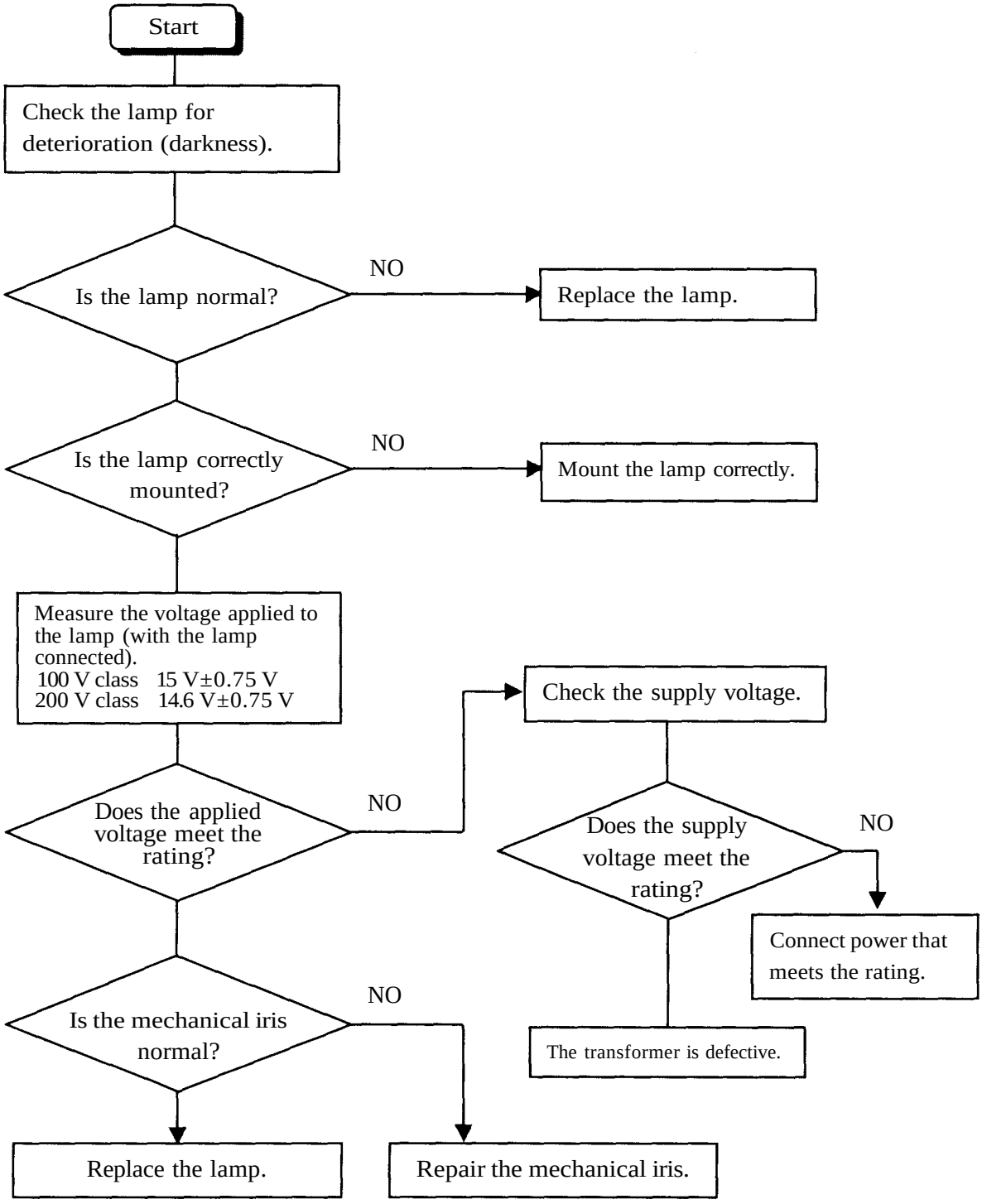
[Symptom: The lamp does not light at all, burns out soon or turns off after once turning on.]


Start
Is the lamp burnt?
NO
Replace the lamp, and age it for a while.
YES
YES
Is the lamp burnt soon?
Measure the voltage applied to the lamp (with the lamp connected).
100 V class 15 V±0.75 V
200 V class 14.6 V±0.75 V
Check the voltage supplied to the transformer.
Does the voltage meet the standard?
Does the voltage meet the rating?
NO
YES
YES
The transformer is defective. (Replace the transformer)
Connect power that meets the rating.
Is the contact of the lamp socket deteriorated?
YES
Replace the lamp socket.
Check connection of the terminals and boards, and check the state of the harness.
End

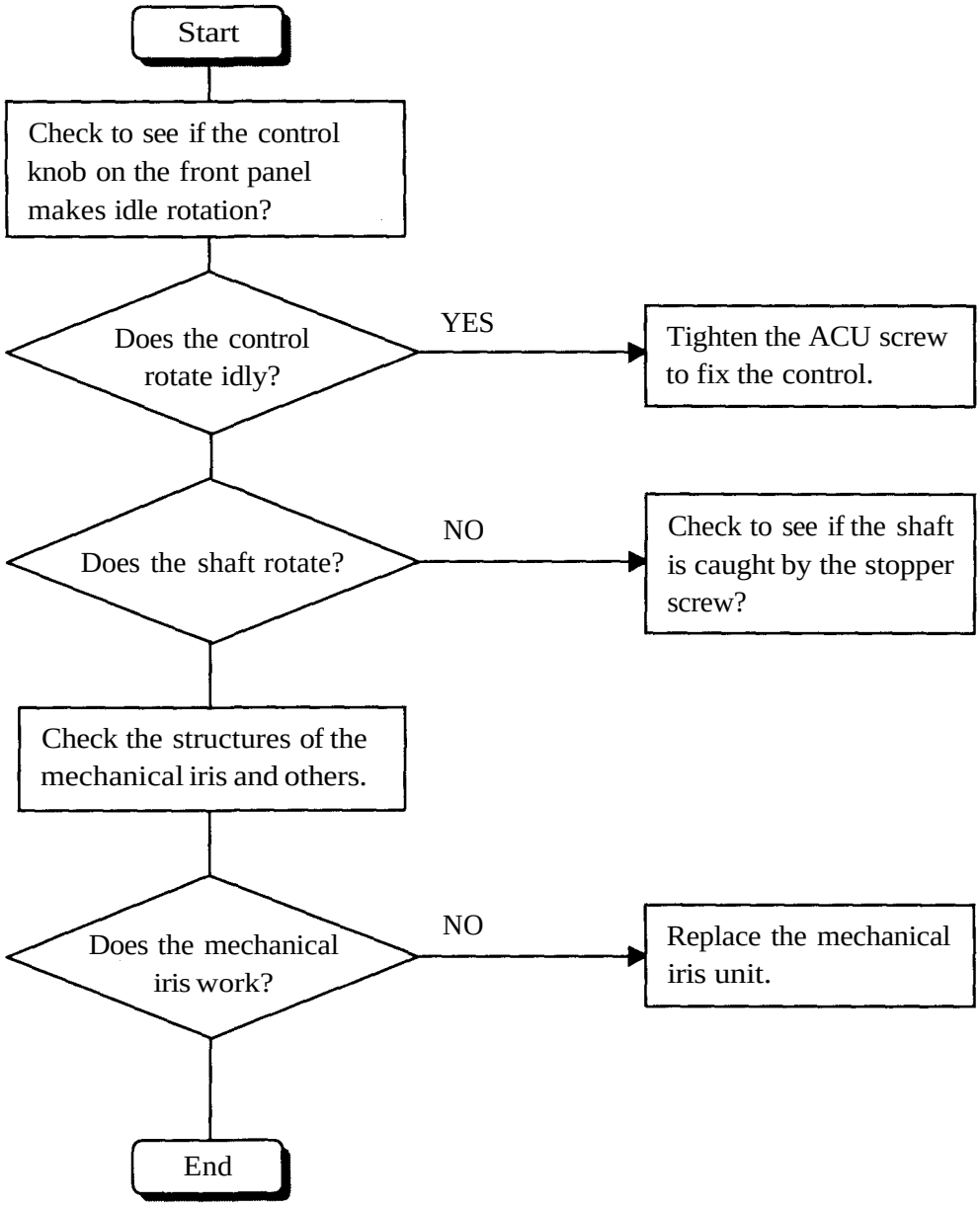
[Symptom: The fan does not work.]


Start
Do the both two fans work?
Only one fan works.
Change connection of the connectors.
NO
Do the fans work?
YES
Check wiring and connection of the connectors.
The fan is defective (one fan).
Check the voltage applied to the fan.
Is 16.5±0.75 V DC applied?
YES
The fan is defective.
* The rated voltage of the fan is 24 V DC, but the fan works normally if the supply voltage is in the operating range of 10 - 27.6 V DC.
Measure the voltage applied to the lamp (with the lamp connected).
100 V class 15 V±0.75 V
200 V class 14.6 V±0.75 V
Does the applied voltage meet the rating?
YES
The power supply board UPCH10U is defective. (diode/capacitor)
NO
Check wiring and connection of the connectors.

[Symptom: Brightness is insufficient.]


Start
Check the lamp for deterioration (darkness).
Is the lamp normal?
NO
Replace the lamp.
Is the lamp correctly mounted?
NO
Mount the lamp correctly.
Measure the voltage applied to the lamp (with the lamp connected).
100 V class 15 V±0.75 V
200 V class 14.6 V±0.75 V
Does the applied voltage meet the rating?
NO
Check the supply voltage.
Does the supply voltage meet the rating?
NO
Connect power that meets the rating.
The transformer is defective.
Is the mechanical iris normal?
NO
Replace the lamp.
Repair the mechanical iris.

[Symptom: Light can not be controlled.]


Start
Check to see if the control knob on the front panel makes idle rotation?
Does the control rotate idly?
YES
Tighten the ACU screw to fix the control.
Does the shaft rotate?
NO
Check to see if the shaft is caught by the stopper screw?
Check the structures of the mechanical iris and others.
Does the mechanical iris work?
NO
Replace the mechanical iris unit.
End

5. DISASSEMBLING/ASSEMBLING PROCEDURE

1. Precautions on Disassembling/Assembling

- Replace the parts and wires to the original positions.
- For electrical safety and standard, be sure to reassemble the following parts to the original states.
  ① Insulation tube and mylar sheet
  ② Cables clamped and separated from the heating parts or high-voltage parts
  ③ Cover screws with a toothed lock washer to suppress a radiation noise
- Use the specified parts.
- The parts used in this unit are designed protective against vibration, heat and high voltage. Be sure to select the parts with the same characteristics from the parts list when replacing the parts.
- Be careful when disconnecting the cable housing.
- Don't pull the cable. Be sure to use the special tool.

2. Jigs and Tools

No.	Name	No.	Specification	Remarks
1	Phillips screwdriver No. 2	OT0376		
2				
3				
4				

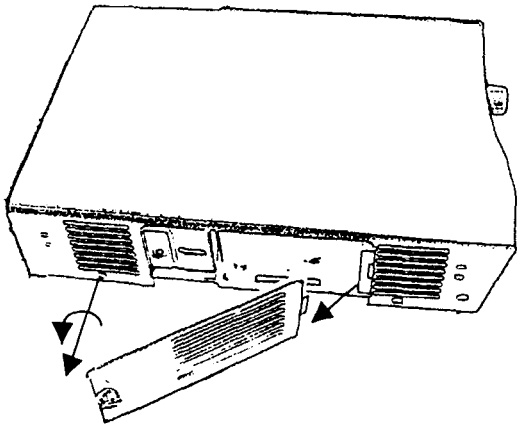
3. Assembling

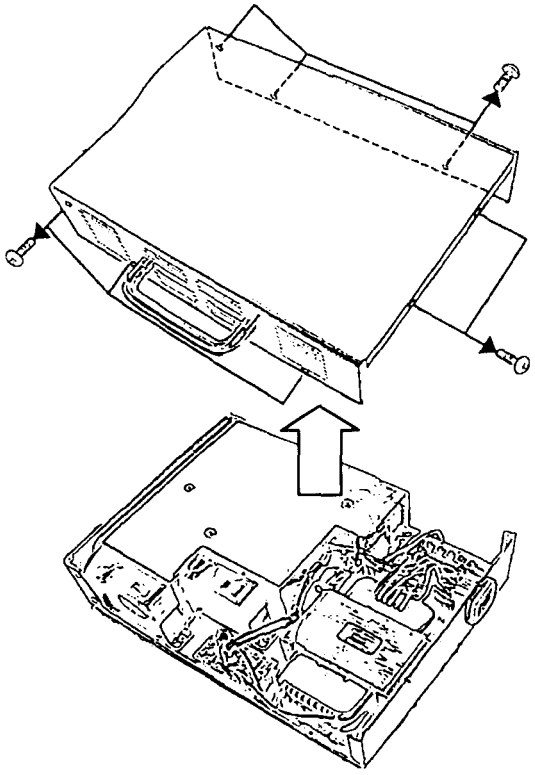
Reverse the disassembling procedure.

4. Disassembling

1. Top cover

(1) Remove the door by turning the knob.

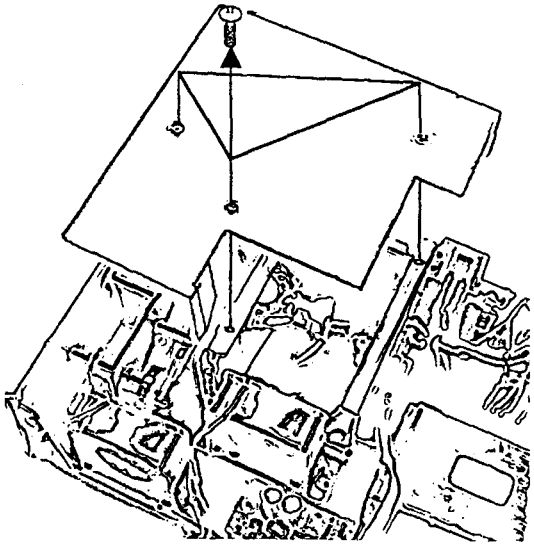




(2) Remove the eight screws which secure the top cover to the main body.

Phillips screwdriver No. 2

(3) Remove the top cover from the main body.

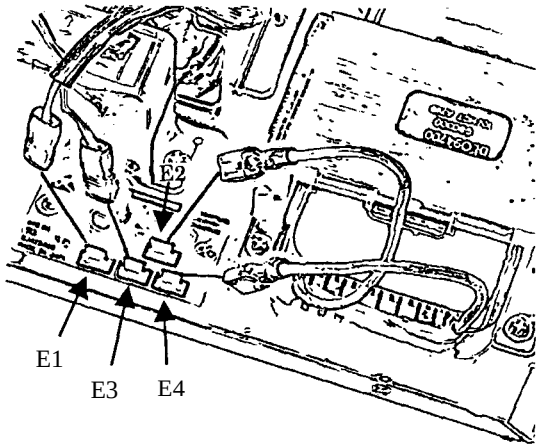


2. Upper heat shielding plate

(1) Remove the three screws which secure the upper heat shielding plate to the main body.

Phillips screwdriver No. 2

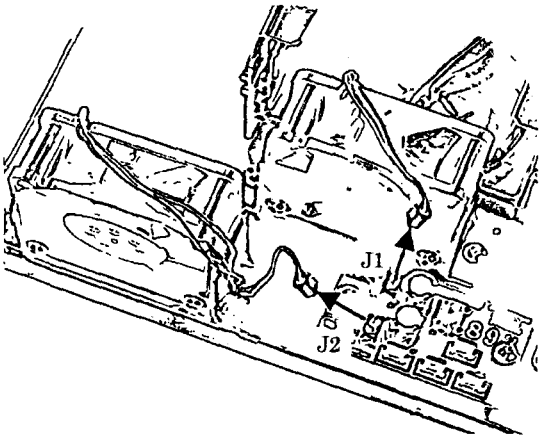
(2) Remove the upper heat shielding plate from the main body.



3. UPCH10U

(1) Remove the terminal of Socket harness from the UPCH10U board.

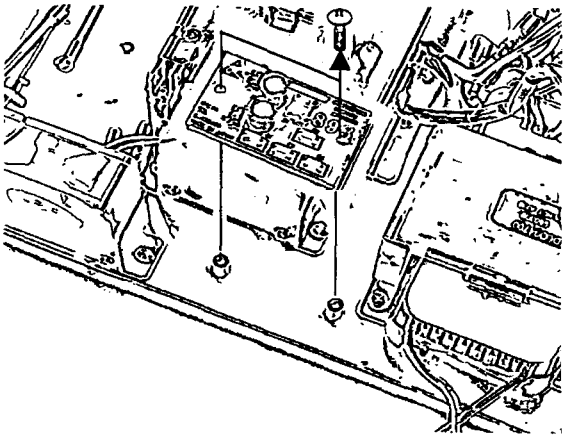
(2) Remove the lead terminal of the transformer from the UPCH10U board.



(3) Remove the connector of the fan U from the UPCH10U board.

(4) Remove the two screws which secure the UPCH10U to the chassis.

Phillips screwdriver No. 2

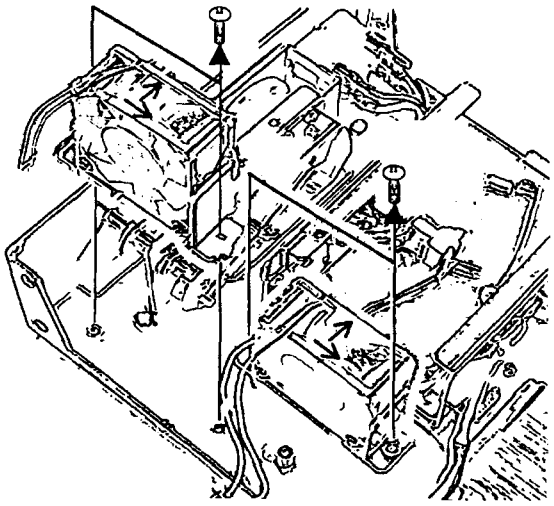


(5) Remove the UPCH10U from the chassis.

4. Fan

(1) Remove the two screws which secure the fan to the chassis.

Phillips screwdriver No. 2

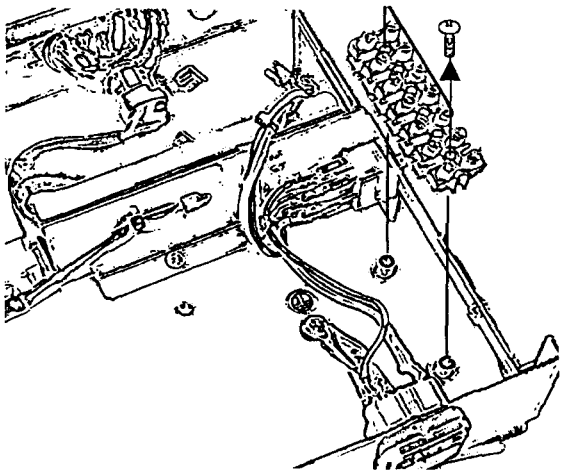


(2) Remove the fan from the chassis.

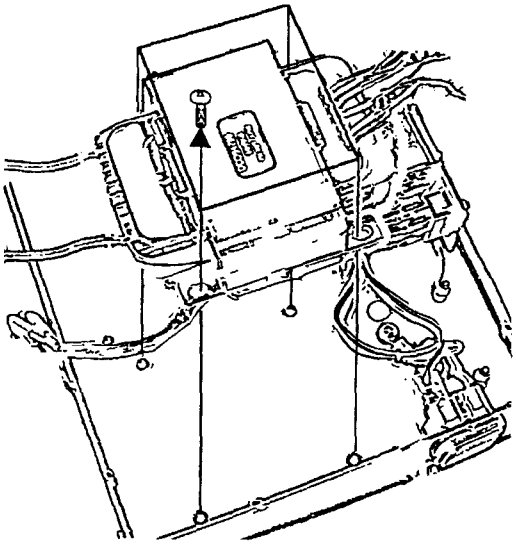
5. Terminal block

(1) Remove the two screws which secure the terminal block to the chassis.

Phillips screwdriver No. 2



(2) Remove the terminal block from the chassis.

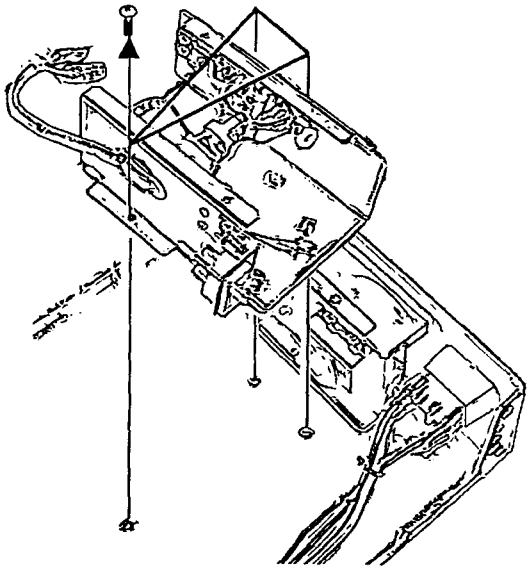


6. Transformer

(1) Remove the four screws which secure the transformer to the chassis.

Phillips screwdriver No. 2

(2) Remove the transformer from the chassis.

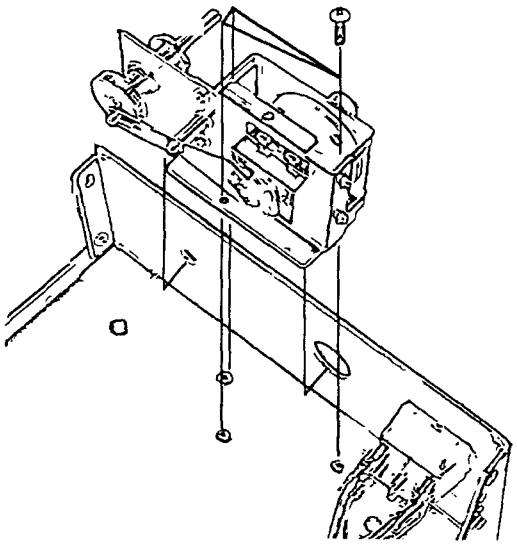


7. Frame

(1) Remove the three screws which secure the frame to the chassis.

Phillips screwdriver No. 2

(2) Remove the frame from the chassis.



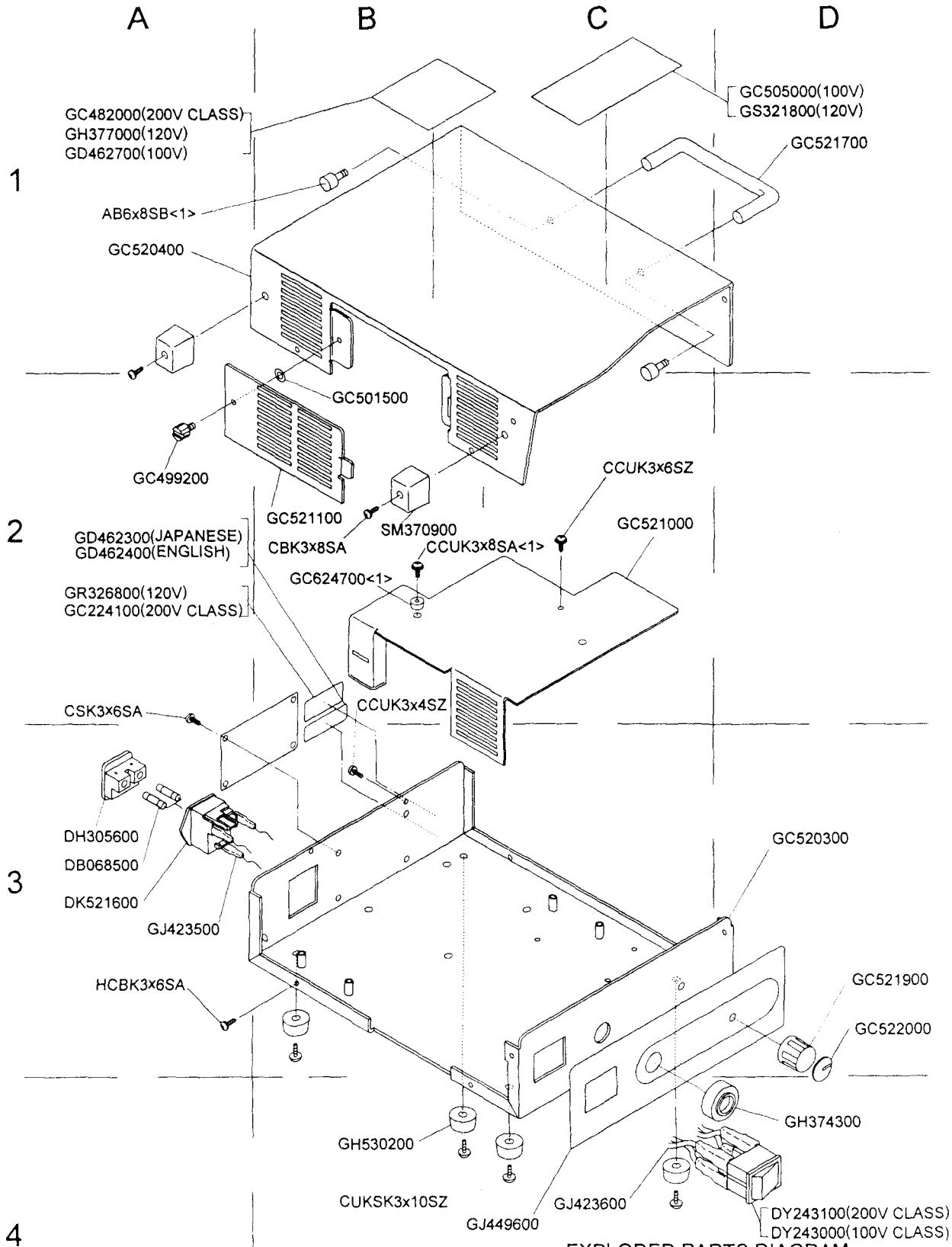
8. Diaphragm

(1) Remove the three screws which secure the. diaphragm to the chassis.

Phillips screwdriver No. 2

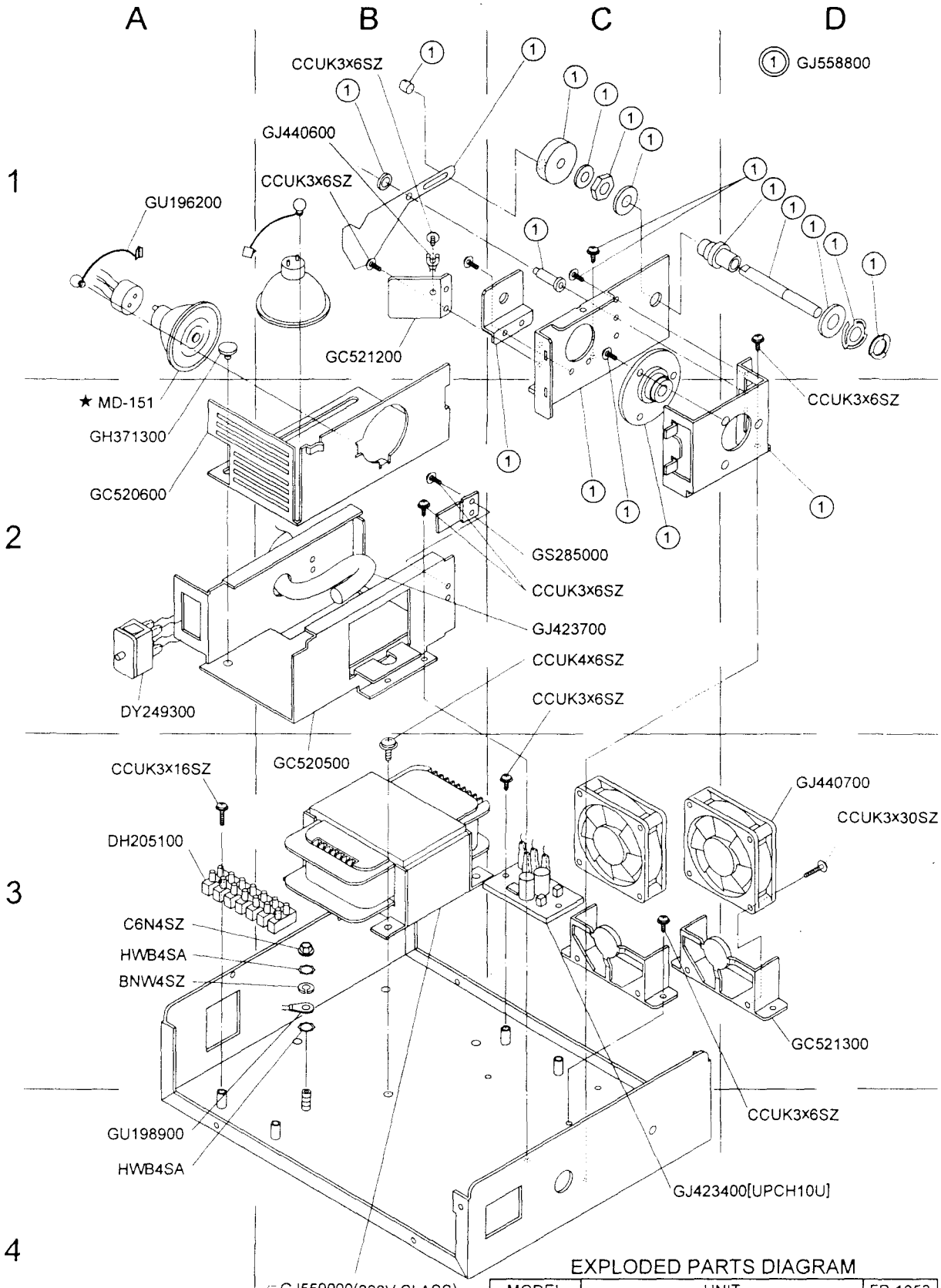
(2) Remove the diaphragm from the chassis.

6. EXPLODED PARTS DIAGRAM



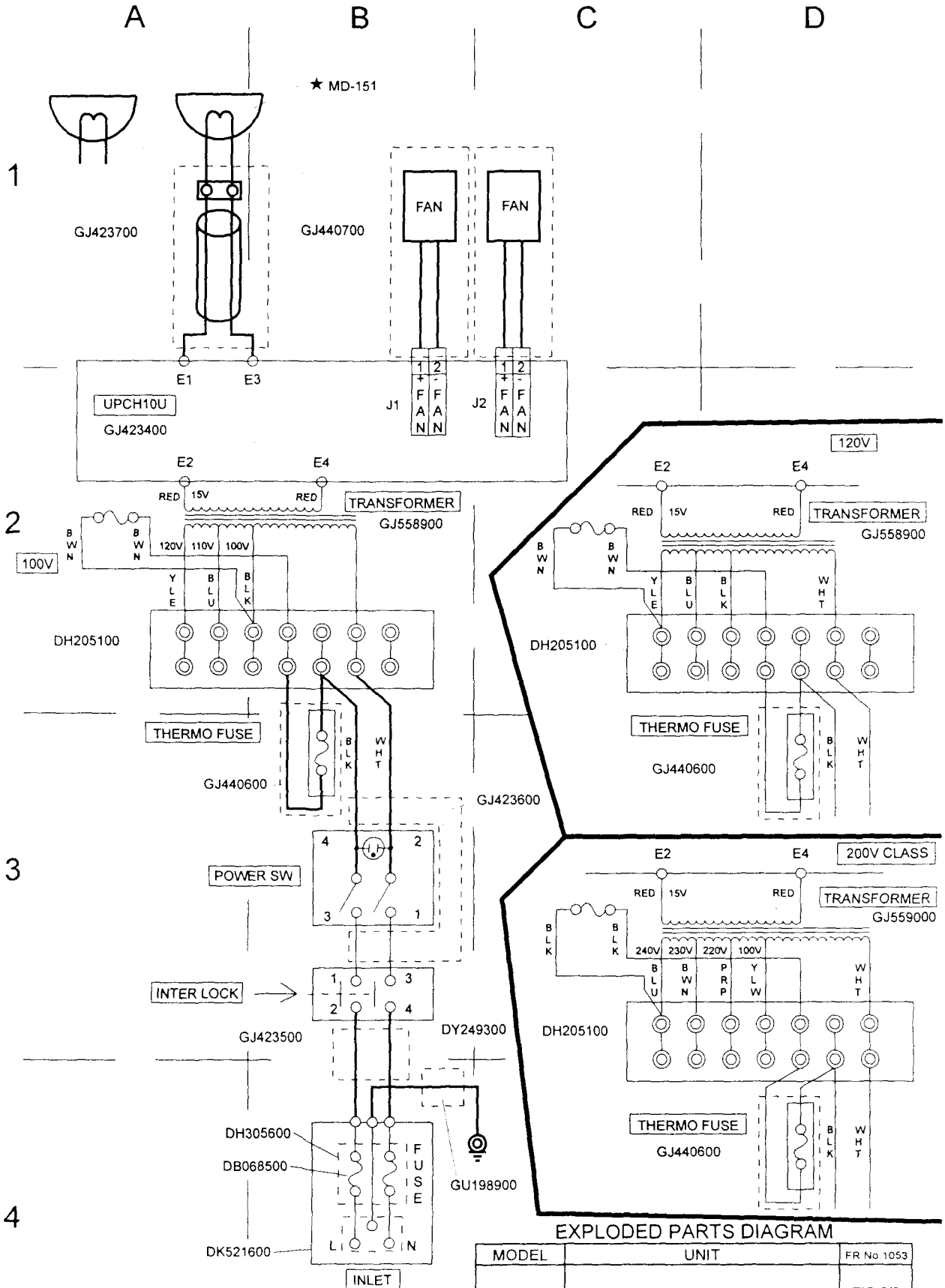
EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1053
CLH-SC	COVER & SHASSY	FIG.1/3
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		



EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR.1053
CLH-SC	MAIN UNIT	FIG.2/3
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		



EXPLODED PARTS DIAGRAM

MODEL	UNIT	FR No.1053
CLH-SC	CABLE	FIG.3/3
OLYMPUS OPTICAL CO.,LTD. TOKYO JAPAN		

7. PARTS LIST

PARTS No.	INDEX	PARTS NAME	SPECIFICATION	REMARK
DB068500	1-A1	FUSE		
DH205100	2-A3	TERMINAL		
DH305600	1-A3	FUSE		
DK521600	1-A3	POWER CONNECTOR		
DY243000	1-D4	POWER SW	POWER SW	100V CLASS
DY243100	1-D4	POWER SW	POWER SW	200V CLASS
DY249300	2-A2	INTER LOCK SW	INTER LOCK	
GC224100	1-A2	CE PLATE		
GC482000	1-A1	PLATE MD151		200V CLASS
GC499200	1-A2	SCREW		
GC501500	1-B2	WASHER		
GC505000	1-D1	J CAUTION PLATE		
GC520300	1-D3	MAIN SHASSY		
GC520400	1-A1	COVER		
GC520500	2-B3	FRAME		
GC520600	2-A2	LAMP BASE		
GC521000	1-C2	TOP HEAT STOPPER BOARD		
GC521100	1-B2	DOOR		
GC521200	2-B2	HEAT STOPPER BOARD		
GC521300	2-D3	FAN HOLDER		
GC521700	1-D1	HANDLE		
GC521900	1-D3	KNOB		
GC522000	1-D3	KNOB CAP		
GC624700	1-B2	SPACER		
GD462300	1-A2	J PLATE		JAPANESE
GD462400	1-A2	E PLATE		ENGLISH
GD462700	1-A1	J LAMP PLATE		100V
GH371300	2-A2	SLIDE SCREW		
GH374300	1-D4	RING		
GH377000	1-A1	E LAMP PLATE		120V
GJ423400	2-C4	UPCH10U		
GJ423500	1-A3	INLET INTER-HU	INLET INTER-HU	
GJ423600	1-C4	INTER SW-HU	INTER SW-HU	
GJ423700	2-C2	SOKET-HU	SOKET-HU	
GJ440600	2-B1	THERMO-HU	THERMO-HU	
GJ440700	3-D3	FAN-U	FAN-U	
GJ449600	1-C4	PANEL PLATE		
GJ530200	1-B4	FOOT		
GJ558800	2-D1	IRIS U		
GJ558900	2-B4	TRANSFORM		100V CLASS
GJ559000	2-B4	TRANSFORM		200V CLASS
GR326800	1-A2	CUL SEAL		
GS285000	2-C2	BOUL BOARD		
GS321800	1-D1	PLATE		
GU196200	2-A1	SPRING U		
GU198900	2-A4	GND-HU	GND-HU	
SM370900	1-B2	SUB FOOT		
BNW4SZ	2-A3	WASHER	WE303014	
C6N4SZ	2-A3	SCREW	WE178003	
CBK3x8SA	1-B2	SCREW	WE139006	
CCUK3x16SZ	2-A3	SCREW	WE139017	
CCUK3x30SZ	2-D3	SCREW	WE139034	
CCUK3x4SZ	1-B2	SCREW	WE139006	

PARTS No.	INDEX	PARTS NAME	SPECIFICATION	REMARK
CCUK3x6SZ	1-C2	SCREW	WE139002	
CCUK4x6SZ	2-C2	SCREW	WE139005	
AB6x8SB	1-A1	SCREW	WE402456	
CSK3x6SA	1-A2	SCREW	WE106060	
CUKSK3x10SZ	1-B4	SCREW	WE168012	
HCBK3x6SA	1-A3	SCREW	WE129002	
HWB4SA	2-A3	WASHER	WE306009	

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